

***Zanclognatha* Species in Mt. Changbai, with Description of a  
New Species and Two Unknown Species from China  
(Lepidoptera: Noctuidae)**

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**ABSTRACT**

In the lepidopteran surveys in Mt. Changbai, China, during 2000-2003, 10 species of the genus *Zanclognatha* Lederer of Noctuidae were recognized. Of them, a new species, *Zanclognatha lui* sp. nov. is described, two species (*Zanclognatha umbrosalis* Staudinger and *Z. perfractalis* Bryk) are reported for the first time from China, and four species (*Z. fumosa*, *Z. lilacina*, *Z. violacealis* and *Z. tarsipennalis*) are newly known from Mt. Changbai. Synonymies, distributional ranges, photos of the genitalia, and images of the new and newly recorded species are given.

Key words: taxonomy, Mt. Changbai, Herminiinae, *Zanclognatha*, China

**INTRODUCTION**

The genus *Zanclognatha* Lederer belonging to the subfamily Herminiinae are medium sized moths, and it comprises 96 species in the world (Poole, 1989). The genus is characterized by the male antenna with a large knot, the sickle-shaped and upturned labial palpus, forewing with  $R_{3+4}$ ,  $R_5$  connate from areole, and hindwing with  $M_3$  and  $CuA_1$  connate. Owada (1977) grouped the genus into two species-groups, *yakushimalis*-group and *leechi*-group, according to the different shape of the valva of the male genitalia: *yakushimalis*-group with ramificated valva and *leechi*-

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group unramificated. In China, 29 species of the genus *Zanclognatha* have been known (Wu, 1938; Bryk, 1948; Draudt, 1950; Chen, 1982, 1985, 1991, 1999), however, in Mt. Changbai (China part), three species (*Z. lunalis* (Scopoli), *Z. curvilinea* (Wileman & South), and *Z. helva* Butler) were reported by Wu et al. (1999).

In the recent surveys in Mt. Changbai during 2000–2003 by authors, 10 species of the genus *Zanclognatha* were recognized, including a new species, *Zanclognatha lui* sp. nov. *Zanclognatha umbrosalis* Staudinger and *Z. perfractalis* Bryk are reported for the first time from China. However, the previously known species, *Z. helva* (Butler), was not found in this study.

## MATERIALS AND METHODS

Specimens examined were collected by K. T. Park, L. S. Lu, D. Y. Jin and H. L. Han during expeditions in 2000–2003, and preserved in the Center for Insect Systematics, Kangwon National University, Korea, and a part of them are in the College of Agriculture, Yanbian National University, China. The color standard for the description of adults follows Korerup and Wanscher (1978).

## SYSTEMATIC ACCOUNTS

### Genus *Zanclognatha* Lederer, 1857

Type species: *Pyralis tarsiolumalis* Hübner, 1796 (Europe)

#### \**Zanclognatha lui* Han and Park, sp. nov. (Figs. 1A–D, 3A–B)

**Types.** Holotype: male, Mt. Changbai, Malugou 730 m, Changbai, 6–7 VIII 2002 (Park, Han, Kim), genital slide no. CN-244. Paratypes: 3♂, Mt. Changbai, Erdaobaihe 750 m, 11 VIII 2003 (Han, Jin), 1♂, Mt. Changbai, Weidong 970 m, Fusong, 12 VIII 2003 (Han, Jin), gen. sl. no. CN-243.

**Diagnosis.** The new species is very close to *Z. lunalis* (Scopoli), but it is bigger than the latter in size. Details for their morphological difference are given in Table 1.

**Description.** Male. Wingspan 28–35 mm. Basal shaft of antenna slender (Fig. 1B), median dilated part thinner than that of *Z. lunalis*. Labial palpus gently upturned (Fig. 1C), 3rd segment as long as 2nd, whereas shorter in *Z. lunalis*. Coxa and trochanter of the foreleg (Fig. 1D) similar to those of *Z. lunalis*, but other joints different: femur slender, slightly shorter or as long as coxa, basal part of ventral margin swollen and slightly sclerotized; tibia extremely broad, mellon seed-shaped, 2/3 as long as femur, overlapped 1st tarsus; 1st tarsus about 2/3 as long as tibia, slightly narrower in terminal part; other tarsal segments slender, short, total length almost half length of 1st, and 2nd–5th–3rd–4th by turns in length; hair tufts in pretarsus developed. Forewing with antemedian line convex before middle, slightly serrate; median band darker than ground color; connected to reniform spot; reniform spot dark brown, linear, located at middle above cell, sometimes obscure;

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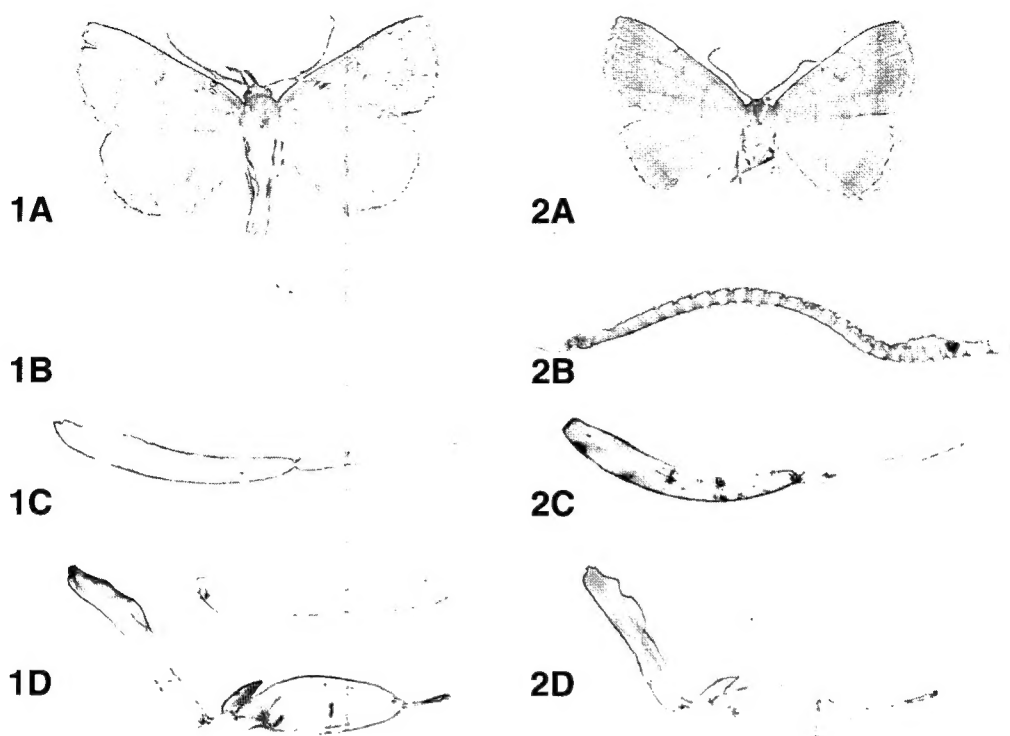
**Table 1.** Comparison of the superficial and male genital characteristics of *Zanclognatha lui* sp. nov. and *Zanclognatha lunalis*.

Characters	Species <i>Z. lui</i> sp. nov.	<i>Z. lunalis</i>
Labial palpus	Gently upturned, 3rd segment as long as 2nd.	Strongly upturned, 3rd segment shorter than 2nd.
Antenna	Basal shaft slender; median dilated part thin.	Basal shaft bulbous; median dilated part thick.
Forewing	Antemedian line strongly convex before middle; median band well-developed; postmedian line less convex medially; subterminal line without creamy white line outwardly.	Antemedian line moderately convex; median band obscure; postmedian line strongly convex medially; subterminal line edged by creamy white line.
Foreleg	Femur as long as tibia + tarsus; slightly bent at basal 1/3, slightly emmarginate on basal part ventro-medially; tibia, melon-seed-shaped; 1st tarsus broad, length of other tarsus arranged 2nd-5th-3rd-4th by turn.	Femur shorter than tibia+tarsus, deeply emmarginate on basal part ventro-medially; tibia budding leaf-shaped; 1st tarsus slender, length of other tarsus arranged 2nd-3rd-5th-4th by turn.
Male genitalia	Uncus: convex dorsally beyond middle. Valva: costa less convex; 1st and 2nd processes of cucullus short with short, bifurcation; 3rd slender taeniated. Juxta: as long as width of valva with acute apex. Aedeagus: straight; cornuti consist of a row of 5-6 horn-shaped spines laterally, a series of 3-4 long horn-shaped, and 5-6 short conic spines on spiculate surface; vesica terminated into broad tubular.	Uncus: concave dorsally beyond middle. Valva: costa strongly convex; 1st and 2nd processes of cucullus long, with deep bifurcation; 3rd strong with acute apex. Juxta: larger, longer than width of valva with round apex. Aedeagus: curved medially; cornuti consist of a zone of numerous spicules dorsally, with 5-6 long horn-shaped spines, 7-9 short ones laterally, and a zone of spicules ventrally; vesica tapered into slender tubular.

postmedian line thin, arising from costa, convex before middle and incurved to CuA<sub>1</sub>, then slightly curved outwardly, reaching to inner margin; subterminal line dark brown, arising from costa near apex and reaching to before tornus, almost straight; fringes grayish, with a pale ochreous basal line. Hindwing fuscous, as wide as forewing; discal spot indistinct, small; median line obscure; subterminal line distinct, darker; fringes concolorous. Female is unknown.

**Male genitalia** (Fig. 3). Uncus convex beyond middle dorsally, shorter than that of *lunalis*. Valva trifurcate, asymmetrical; costa almost straight before middle; 1st process of distal part short and acute; 2nd digitate with round apex; 3rd slender, taeniated. Juxta conic, as long as width of valva, with acute apex. Saccus short, triangular. Aedeagus almost straight; cornuti consist of 2 series of horn-shaped spines: one row of 5-6 horn-shaped spines and the other mixed with 3-4 long and 5-6 short horn-shaped spines on spiculate surface.

**Distribution.** China (Mt. Changbai).



**Fig. 1A-D.** *Zanclognatha lui* sp. nov. **Fig. 2A-D.** *Z. lunalis*. 1A-2A, adults; 1B-2B, antennae; 1C-2C, labial palpi; 1D-2D, forelegs.

### Newly reported species from China

#### \**Zanclognatha umbrosalis* Staudinger, 1892 (Figs. 5, 13A-C)

*Zanclognatha umbrosalis* Staudinger, 1892. p. 613, pl. 14, fig. 8; Herz, 1904, p. 324; Owada, 1992, p. 189; Kononenko et al., 1998, p. 34.

*Zanclognatha triplex koreognatha* Bryk, 1948, p. 147.

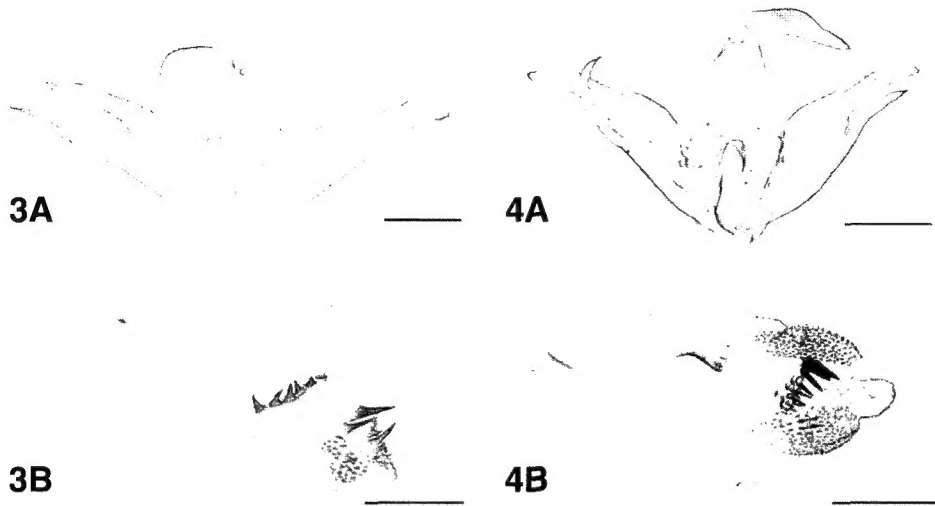
*Zanclognatha leechi* South, 1905, p. 74; Owada, 1982a, p. 929; 1982b, p. 407; 1987, p. 114.

**Diagnosis.** Wingspan 24-25 mm. Forewing ground color is dark fuscous; with antemedian line broad, dark, waved; median line blurred, almost straight; reniform spot small, often inconspicuous; postmedian line broad, curved outwardly from costa to  $M_3$ , then incurved, slightly waved; marginal line weak paler than ground color. Hind wing is fuscous, with median line often distinct; postmedian line blurred, darker than ground color at anal angle.

**Male genitalia** (Figs. 13A-B). Uncus sickle-shaped. Valva broad at basal half, then suddenly narrowed from middle to apex; costa slightly expanded at basal 1/3. Aedeagus slender, slightly curved; cornutus horn-shaped, strong, longer, bifurcated basally.

**Female genitalia** (Fig. 13C). Ductus bursae heavily sclerotized at distal half, with bilateral

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**Fig. 3A-B.** *Zanclognatha lui* sp. nov. **Fig. 4A-B.** *Z. lunalis*. 3A-4A, male genitalia; 3B-4B, aedeagi. Scales = 1 mm.

processes anteriorly; cervix bursae small, slightly shrank; corpus bursae round, with strong spines forming a semicircle.

**Material examined.** 1 ♀, Chongshan 600 m, Helong, 31 VII 2000 (Park, Lee, Han); 1 ♂, Longjing 280 m, 12 VII 2001 (Park, Sohn, Han); 1 ♂, Weidong 1,250 m, Fusong, 16 VII 2001 (Park, Sohn, Han); 2 ♀, Malugou 730 m, Changbai, 6-7 VIII 2002 (Park, Han, Kim).

**Distribution.** China (new record), Korea (North, South), Japan, Russia (RFE-Primorye, Khabarovsk).

**\**Zanclognatha perfractalis* Bryk, 1948 (Figs. 6, 12A-B)**

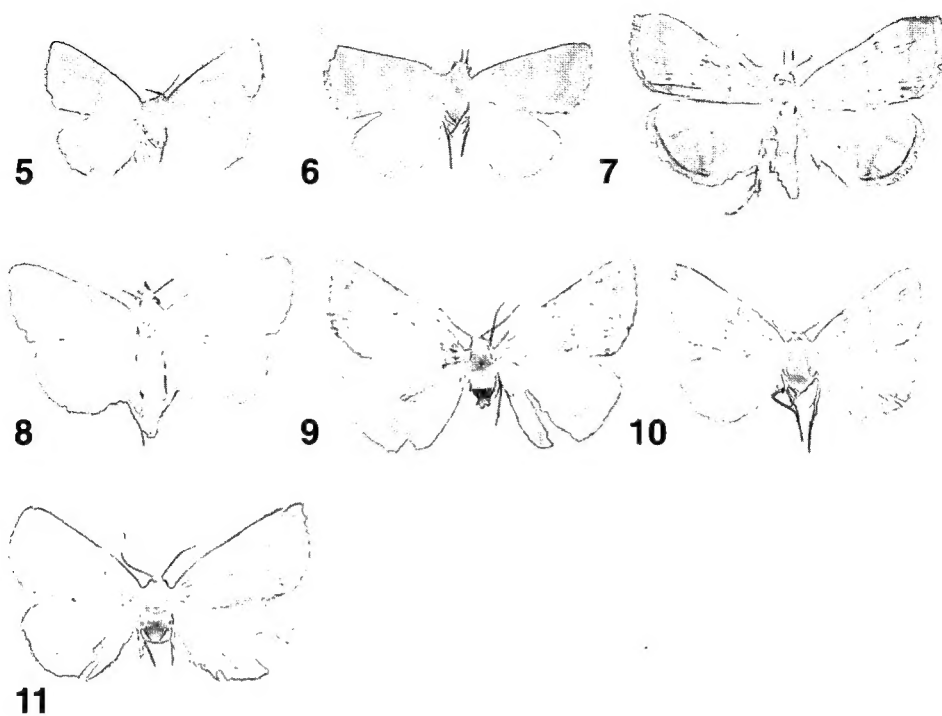
*Zanclognatha perfractalis* Bryk, 1948, p. 147, pl. 6, fig. 7; Owada, 1992, p. 189.

*Zanclognatha southi* Owada, 1982, p. 929; 1987, p. 115; Kononenko et al., 1998, p. 34.

**Diagnosis.** Wingspan 21-23 mm. Forewing ground color is dark fuscons. Wing Coloration is similar to that of *Z. lunalis*, with antemedian line broad, waved; median line broad, dark; reniform spot dark; very small, or sometimes absent; postmedian line thin, waved; subterminal line broad, dark, curved at middle. Hindwing is paler than forewing, with median line indistinct and postmedian line broad blurred, darker at near anal angle.

**Male genitalia** (Figs. 12A-B). Very similar to those of *Z. umbrosalis*. Distal part of valva not sharply pointed. Saccus "V"-shape. Juxta weakly sclerotized, with very small pellet, or tiny spines. Aedeagus slender, slightly curved beyond middle; cornutus shorter and broader than that of *Z. umbrosalis*.

**Material examined.** 1 ♂, 1 ♀, Malugou 730 m, Changbai, 7 VIII 2002 (Park, Sohn, Han); 1 ♂, Jiashan 510 m, Helong, 14 VIII 2003 (Han, Jin).



**Figs. 5-11.** Adults. 5, *Zanclognatha umbrosalis*; 6, *Z. perfractalis*; 7, *Z. fumosa*; 8, *Z. tarsipennalis*; 9, *Z. lilacina*; 10, *Z. violacealis*; 11, *Z. curvilinea*.

**Distribution.** China (new record), Korea (North, Central), Japan, Russia (RFE-Primorye territory).

### Newly reported species from Mt. Changbai

#### \**Zanclognatha fumosa* Butler, 1879 (Fig. 7)

*Herminia fumosa* Butler, 1879, p. 62, pl. 56, fig. 8.

**Material examined.** 2 ♀, Jiashan 600 m, Helong, 1-2 VIII 2000 (Park, Lee, Han).

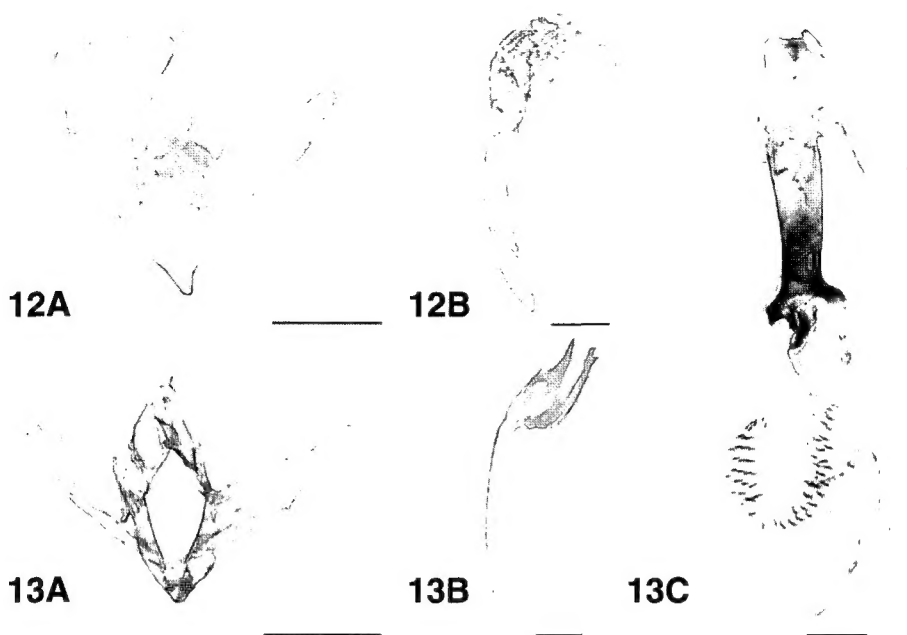
**Distribution.** China (Jilin, Heilongjiang), Korea (North, South), Japan, Russia (RFE-Primorye territory).

#### \*\**Zanclognatha tarsipennalis* (Treitschke, 1835) (Fig. 8)

*Herminia tarsipennalis* Treitschke, 1835. p. 5.

**Material examined.** 1 ♀, Erdao power plant 760 m, Antu, 30 VII 2000 (Park, Lee, Han); 1 ♂, Jiashan 680 m, Helong, 13 VII 2001 (Park, Sohn, Han); 1 ♀, Malugou 730 m, Changbai, 6-7 VIII 2002 (Park, Han, Kim).

**Distribution.** China (Jilin, Hubei, Taiwan), Korea (North, South), Japan, Russia (European part, S Siberia, RFE), Caucasus, Turkey, N. Africa.



**Fig. 12A-B.** *Zanclognatha perfractalis*. **Fig. 13A-C.** *Z. umbrosalis*. 12A-13A and 12B-13B, male genitalia; 13C, female genitalia. Scales = 1 mm.

<sup>1</sup>***Zanclognatha lilacina* Butler, 1879 (Fig. 9)**

*Mesoplectra lilacina* Butler, 1879, p. 65, pl. 57, fig. 3; Leech, 1889, p. 566; 1900, p. 618.

**Material examined.** 1 ♀, Chongshan 600 m, Helong, 14 VII 2001 (Park, Sohn, Han).

**Distribution.** China (Jilin, Zhejiang, Jiangxi, Fujian), Korea (North, Central), Japan, Russia (RFE-Primorye territory).

<sup>2</sup>***Zanclognatha violacealis* Staudinger, 1892 (Fig. 10)**

*Zanclognatha violacealis* Staudinger. 1892, p. 612, pl. 14, fig. 6.

**Material examined.** 1 ♀, Malugou 730 m, Changbai, 6-7 VIII 2002 (Park, Han, Kim).

**Distribution.** China (Jilin, Heilongjiang), Korea (North), Japan, Russia (RFE-Primorye territory, S Khabarovsk terr., Amur region, S Sakhalin).

**New collecting data for the previously reported species from Mt. Changbai**

<sup>3</sup>***Zanclognatha lunalis* (Scopoli, 1763) (Figs. 2A-D, 4A-B)**

*Phalaena lunalis* Scopoli, 1763, p. 241, fig. 612.

**Material examined.** 3 ♀, Chongshan 600 m, Helong, 31 VII 2000 (Park, Lee, Han); 1 ♂, 4 ♀, Jiashan 600 m, Helong, 1-2 VIII 2003 (HL Han, DY Jin); 2 ♂, 1 ♀, Chongshan 600 m, Helong, 14 VII 2001 (Park, Sohn, Han); 3 ♂, 5 ♀, Yadong 760 m, Helong, 19 VII 2001 (Park, Sohn,

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Han); 1♂, 1♀, Jiashan 600 m, Helong, 20 VII 2001 (Park, Sohn, Han); 2♂, 2♀, Malugou 730 m, Changbai, 6-7 VIII 2002 (Park, Han, Kim); 1♂, Weidong 970 m, Fusong, 12 VIII 2003 (HL Han, DY Jin); 4♂, 6♀, Jiashan 510 m, Helong, 14 VIII 2003 (HL Han, DY Jin); 2♂, 1♀, Renchuan 370 m, Longjing, 15 VIII 2003 (HL Han, DY Jin); 1♂, 1♀, Yongxin 570 m, Longjing, 16 VIII 2003 (HL Han, DY Jin).

**Remark.** The species was reported from Mt. Changbai by Wu et al. (1999), and the first reported from Korea was as a subspecies *chosensis* Bryk, 1948.

**\**Zanclognatha curvilinea* (Wileman & South, 1917) (Fig. 11)**

*Paracolax curvilinea* Wileman & South, 1917, p. 27.

**Material examined.** 1♀, Malugou 730 m, Changbai, 6-7 VIII 2002 (Park, Han, Kim).

**Remark.** The species was reported from Mt. Changbai by Wu et al. (1999).

**\*\**Zanclognatha helva* (Butler, 1879)**

*Herminia helva* Butler, 1879, p. 477; Leech, 1989, p. 563.

**Remark.** The species was reported from Mt. Changbai by Wu et al. (1999), but it was not found during the expeditions in 2000-2003. However, there is no doubt for its distribution in Mt. Changbai, because its distributional range covers from Primorye territory to China and Japan, including the Korean peninsula.

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## REFERENCES

- Bryk, F., 1948. Grobschmetterling Von Korea. Ark. Zool. **41**(A): 50-225, pls. I-VII.  
 Chen, Y. X., 1982. Iconographia Heterocerorum Sinicorum. Beijing Science Press, III: 237-387, pl. 76-117.  
 Chen, Y. X., 1985. Economic Insect Fauna of China. Beijing Science Press, Fasc. 32. Lepidoptera: Noctuidae **4**: 1-167, pl. I-XV.  
 Chen, Y. X., 1991. A new genus and two new species of Noctuidae (Lepidoptera) from China. Acta Entomol. Sin., **34**(3): 472-474.

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- Chen, Y. X., 1999. Lepidoptera: Noctuidae. Fauna Sin. Insect **16**: 810-813, pls. XXXVII.
- Draudt, M., 1950. Beitrage zur Kenntniss der Agrotiden-Fauna Chinas. Aus den Ausbeuten Dr. H. Höne's. Mitt. Munch. Entomol. Ges., **49**: 1-174, pls I-XV.
- Inoue, H. and S. Sugi, 1958. Checklist of the Lepidoptera of Japan. Pt 5. Noctuidae. Tokyo, Rikusuisha, pp. 431-669.
- Kononenko, V. S., S. B. Ahn and L. Ronkay, 1998. Illustrated Catalogue of Noctuidae in Korea (Lepidoptera). In Park, K.T. ed., Insects of Korea. Seoul, pp. 32-35.
- Kornerup, A. and J. H. Wanscher, 1978. Methuen Handbook of Colour. Eyre Methuen, Lond., pp. 1-252
- Leech, J. H., 1889. On the Lepidoptera of Japan and Corea. Part III. Heterocera, Sect. I. Noctues and Deltoides. Proc. Zool. Soc. Lond., pp. 474-571.
- Owada, M., 1977. Taxonomic studies on *Zanclognatha yakushimalis* (Noctuidae) and its allied species from Japan and Taiwan, with description of two new species. Tinea, **19**(11): 103-117.
- Owada, M., 1982. Noctuidae (Herminiinae). In Inoue, H., S. Sugi, H. Kuroko, S. Moriuti, and A. Kawabe, eds., Moths of Japan. Tokyo, **1**: 913-935; **2**: 405-408, pls 224-226, 356, 381-392.
- Owada, M., 1987. A taxonomic study of the subfamily Herminiinae of Japan (Lepidoptera, Noctuidae). Natn. Sci. Mus., Tokyo, pp. 1-208.
- Owada, M., 1992. Synonymic notes on the herminiine moths (Noctuidae) of Japan, with descriptions of three new species. Tinea, **13**(18): 183-203.
- Poole, R. W., 1989. Noctuidae. Lepidopterorum Catalogues (New Series). Fascicle 118, Part 1: v-xii+1-500; part 2: 501-1013; part 3: 1014-1314. E.J. Brill, Leiden.
- Sugi, S., 1959. New species of the Quadrid subfamilies of the Noctuidae from Japan (I) (Lepidoptera). Tinea, **5** (1): 277-285.
- Wu, C. F., 1938. Catalogus Insectorum Sinensium. Pt. 4. The Fan Memorial Institute of Biology, Beijing, pp. 554-559.
- Wu, K. Y., S. P. Sun, F. Chen, L. T. Wang and B. Yu, 1999. A list of the insects in the forest areas of Changbai mountains. II. Noctuidae. For. Pest Dis., **3**: 34-36.

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장백산의 *Zanclognatha*속 1신종 기재 (나비목: 밤나방科) 및  
중국 미기록 2종의 보고

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요 약

2000-2003년에 걸쳐 수행된 장백산의 나방류 조사결과로 *Zanclognatha*속 10종이 확인 되었다. 그들 중 한 종을 신종(*Zanclognatha lui* sp. nov.)으로 기재하고, *Zanclognatha umbrosalis* Staudinger, *Z. perfractalis* Bryk 등 2종을 중국 미기록으로 보고 한다. *Z. fumosa*, *Z. lilacina*, *Z. violacealis*, *Z. tarsipennalis* 등 4종은 장백산에서 처음 보고 되는 종들이다. 새로이 밝혀진 신종, 중국미기록 2종에 대해 성충의 외부특징과 암수생식기의 특징에 대해 간략히 기술하고, 성충의 사진과 함께 암수생식기를 도해하였다.